ARC 5235

RFID Automated Transactions

The purpose of this project is to automate simple shop floor transactions through the reading of RFID labels.

This project requires assistance from Brady Stevens to set up, RFID label printing hardware, RFID reading hardware, and the third party software ClearStream for managing the RFID hardware. The files and tables can be installed from ARC, but there are additional scripts that can be optionally set up as well. ClearStream will need to be set up to write the proper data to the custom tables.

The current supported transactions are J52 (WIP to FG), J55 (Issue Material), L01 (Labor Upload), P10 (PO Receipts), O90 (Bin to Bin), and S99 (Load Validation).

Maintenance:

The options for this project can be maintained with the menu item Shop Floor Control > Administration > RFID Maintenance [5235].

The grid on the left will load in the antenna/reader list from the GCG_5235_RFID_HDWR table. Double clicking on an antenna/reader combination will bring up the last read time for it as well as the options for it. Select the transactions you want to enable it for. Most transactions have the option of printing a label, selecting a label printer, and turning on failure email notifications with a recipient and sender email address.

For the J55 and O90 transactions, the RFID data is expected to be in the format T[Lot]Q:[Quantity]. For example, T00001:Q10 where the lot is 00001 and the quantity is 10. Unique lot numbers are required for these transactions.

For the J52, L01, and O90 transactions, the RFID data is expected to be in the format J[JOB]:S[SUFFIX]:Q[Quantity]. For example, J000071:S000:Q35 where 000071 is the job and 000 is the suffix and 35 is the quantity. Unique lot numbers are not required for these transactions.

For the S99 transactions, the RFID data is expected to be in the format [TYPE]:[KEY]:[QUANTITY]. TYPE should be either blank for lot verification, C for Carton validation, or P for Pallet validation. The key should be the lot, pallet, or carton in question, depending on the type.

J55 – Issue Material:

For this transaction, select the work center to issue the material to. There can only be one workorder on the work center at a time. The program will look up the work order currently on the work center and issue the lot number to that.

J52 – WIP to FG:

For this transaction, select a default bin to put the finished good part in. If no bin is selected, the part will be put in standard inventory. The program will read the job, suffix, and quantity from the tag, and run the wip to fg transaction on it. It will honor auto lot numbering options.

O90 – Bin to Bin:

For this transaction, select the bin to transfer to. The program will read the lot and quantity from the tag, and move it from whatever bin it's currently in to the selected bin.

L01 – Labor Upload:

For this transaction, select a work center and an employee. The program will read the job, suffix, and quantity, and claim pieces against the job on that work center with a time of 0.1 hours. This works just like claiming pieces in the GUI, and will not be processed until the next time online update runs. This will trigger any backflushing or auto wip set up just like claiming pieces on the GUI. The sequence will be closed if necessary depending on the close option selected. If the Write Outside PO request checkbox is checked, an outside PO request will be written for the next outside sequence if there is one.

P10 – PO Receipts:

For this transaction, the program will read the job, suffix, and quantity from the tag, and look up the PO line for that job. It will receive pieces to it based on the inspection/job selection.

S99 – Load Validation:

For this transaction, set the URL for the Clearstream API, as well as the reader device and the port mapping. A load will need to be created using the **Shipping & Receiving > Transactions > Load Planning** menu. A load can then be started using the load management custom GS mobile transaction. This can be installed from the included GCG_5235_LoadManagement.g2u-MobExt.zip file using the 5448 GS Mobile Custom Transaction Import/Export Tool. When a tag is read, the program will check the type, key, and quantity from the RFID data. It will verify that this item is on the currently active load, and if this item is valid to load next. If the item is valid, the lightstack will flash green. If the item is valid, but loaded in the wrong order, the lightstack will flash red and yellow. If the item is not found on the load, or some other issue occurs, the lightstack will flash red. Results will also be shown on the Dock Dashboard.

Watchdog:
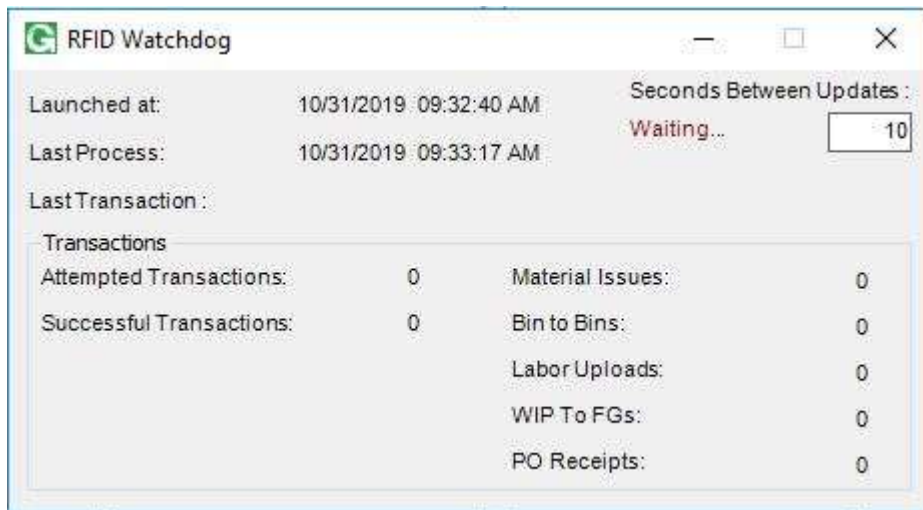
The RFID watchdog will launch from online update if not currently running. It will run until midnight each day, at which point it will close itself and reopen the next time online update processes. The interval between updates can be set here. A log file is written at Global\Custom\5235\Log\RFID_Transactions_Log.txt that will log any errors.

RFID Dashboard:

Tag	Time Last Read	Time Processed	Reader	Antenna	Transaction	RFID Value	Processed	Failed	Fail Reason
68	10/30/2019 2:33:00 PM	10/30/2019 2:33:22 PM	Lab	WIP to FG	J52	J000061:S0...	☑	☐	
67	10/30/2019 2:33:00 PM	10/30/2019 2:33:22 PM	Lab	WIP to FG	J52	J000062:S0...	☑	☐	
66	10/30/2019 2:32:11 PM	10/30/2019 2:32:38 PM	Lab	WIP to FG	J52	J000060:S0...	☑	☐	
65	10/30/2019 2:31:56 PM	10/30/2019 2:32:15 PM	Lab	Receipt	P10	J000062:S0...	☑	☐	
64	10/30/2019 2:31:56 PM	10/30/2019 2:32:15 PM	Lab	Receipt	P10	J000061:S0...	☑	☐	
63	10/30/2019 2:31:56 PM	10/30/2019 2:32:15 PM	Lab	Receipt	P10	J000060:S0...	☑	☐	
62	10/30/2019 2:30:16 PM	10/30/2019 2:30:32 PM	Lab	Labor	L01	J000062:S0...	☑	☐	
61	10/30/2019 2:30:14 PM	10/30/2019 2:30:32 PM	Lab	Labor	L01	J000060:S0...	☑	☐	
60	10/30/2019 2:30:14 PM	10/30/2019 2:30:32 PM	Lab	Labor	L01	J000061:S0...	☑	☐	
59	10/30/2019 2:10:13 PM	10/30/2019 2:11:05 PM	Lab	WIP to FG	J52	J000058:S0...	☑	☐	
58	10/30/2019 2:10:12 PM	10/30/2019 2:11:05 PM	Lab	WIP to FG	J52	J000083:S0...	☑	☐	
57	10/30/2019 2:10:12 PM	10/30/2019 2:11:05 PM	Lab	WIP to FG	J52	J000082:S0...	☑	☐	
56	10/30/2019 2:10:12 PM	10/30/2019 2:11:05 PM	Lab	WIP to FG	J52	J000057:S0...	☑	☐	
55	10/30/2019 2:10:12 PM	10/30/2019 2:11:05 PM	Lab	WIP to FG	J52	J000054:S0...	☑	☐	
54	10/30/2019 2:10:12 PM	10/30/2019 2:11:05 PM	Lab	WIP to FG	J52	J000056:S0...	☑	☐	
53	10/30/2019 2:10:12 PM	10/30/2019 2:11:05 PM	Lab	WIP to FG	J52	J000055:S0...	☑	☐	
52	10/30/2019 2:10:12 PM	10/30/2019 2:11:05 PM	Lab	WIP to FG	J52	J000085:S0...	☑	☐	
51	10/30/2019 2:10:10 PM	10/30/2019 2:11:05 PM	Lab	WIP to FG	J52	J000059:S0...	☑	☐	
50	10/30/2019 2:10:10 PM	10/30/2019 2:11:05 PM	Lab	WIP to FG	J52	J000084:S0...	☑	☐	
49	10/30/2019 2:09:17 PM	10/30/2019 2:09:43 PM	Lab	Receipt	P10	J000082:S0...	☑	☐	
48	10/30/2019 2:09:15 PM	10/30/2019 2:09:43 PM	Lab	Receipt	P10	J000057:S0...	☑	☐	
47	10/30/2019 2:09:15 PM	10/30/2019 2:09:43 PM	Lab	Receipt	P10	J000055:S0...	☑	☐	
46	10/30/2019 2:09:15 PM	10/30/2019 2:09:43 PM	Lab	Receipt	P10	J000083:S0...	☑	☐	
45	10/30/2019 2:09:15 PM	10/30/2019 2:09:43 PM	Lab	Receipt	P10	J000058:S0...	☑	☐	
44	10/30/2019 2:09:15 PM	10/30/2019 2:09:43 PM	Lab	Receipt	P10	J000059:S0...	☑	☐	
43	10/30/2019 2:09:15 PM	10/30/2019 2:09:43 PM	Lab	Receipt	P10	J000084:S0...	☑	☐	
42	10/30/2019 2:09:15 PM	10/30/2019 2:09:43 PM	Lab	Receipt	P10	J000056:S0...	☑	☐	
41	10/30/2019 2:09:14 PM	10/30/2019 2:09:19 PM	Lab	Receipt	P10	J000054:S0...	☑	☐	

Tags: 69

The RFID dashboard is available at Shop Floor Control > View > RFID Dashboard [5235]. This will load in all reads and data about them. You can filter it by reader, antenna, transaction, and tags read in the last x minutes. When changing transaction filters, the program will ask if you'd like to load the default column layout for that transaction, which will remove any columns not related to that transaction. You can refresh it with the refresh button, or set it to auto refresh ever x seconds. If the transaction fails, the fail checkbox will be checked and a reason should be written.

Open WO Dashboard:

The project also includes a modified version of Advanced Planning System > View > Open Work Orders, Advanced Planning System > View > RFID Open WO Dashboard [5235]. This dashboard includes a column for if an RFID label has been printed or not. Click the checkbox when in edit mode to print an RFID label for that work order.

Dock Dashboard:

For S99 transactions, there is a dashboard which can be used on the shop floor to see the results and status of the current load. The dashboard is located at **Shipping & Receiving > View > RFID Dock Dashboard**. On the dashboard, a dock can be selected. The data for the current load on this dock will load. Validated lines will be highlighted green.

Other Features:

- For Winesburg chair, there is also a bin status dashboard to watch the O90 and J55 transactions. This menu item will need to be added manually. The script is GCG_5235_BinStatus.g2u.

- To have failure notifications run, attach the GCG_5235_Notifications.g2u script to the 38130 post online update hook.
- For King Machine, there is a script to close sequences that have been backflushed to using the custom option to backflush to flagged work centers when pieces are claimed on a certain work center. This script will close any sequences with detail records on one of the flagged work centers. Activate this by attaching the GCG_5235_CloseBackflushedSequences.g2u script to the 38130 post online update hook.
- For King Machine, there is also a special version of the RFID Work Order Label, GCG_5235_RFIDWorkOrderLabel_King.lab, which can be manually installed.